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Occasionally we have sample copies returned to us, with the remark, "It is too fine for my blood." Now it occurs to the editors that something of the nature of the MONTHLY is needed to give a better tone to the "blood." Try the MONTHLY a year and see if the tone and vigor of the mind does not improve because of the increased activity of the "blood."

Every lover of Mathematics and every teacher of Mathematics in the United States should take the MONTHLY. Articles are now being published that will after while be reprinted and bound in book form and which alone will then cost the price of the Journal.

Because of the lengthy Biographical sketch published in this number, we have been compelled to defer many interesting communications. It is not the purpose of the MONTHLY to publish such extended biographies, except when, as it is in this case, the life of the man treated justifies it.

We have a number of criticisms and replies to certain problems and articles which will appear as we find room. We hope that our contributors will take these criticisms in a spirit of kindness. It is not the purpose of the MONTHLY to publish lampoons, or sarcastic criticisms. Its object is to promote the science of Mathematics and Mathematical teaching.

It is objected that some of the problems published are not worthy of a place in the MONTHLY, being too easy. On the other hand we are admonished not to soar entirely in the higher regions of Mathematical thought but publish problems for the use of classes in the various branches of Mathematics. Now as we are publishing an unusually large Magazine, at an unusually low price, we will try to harmonize these jarring interests by giving space alike to elementary and higher Mathematics.

Dr. Paul Staeckel of the University of Halle and Professor Friedrich Engel of the University of Leipzig will publish through Teubner in Leipzig within a year, under the title "Theorie der Parallellinien," the First Book of Saccheri's marvelous treatise now appearing in English in the AMERICAN MATHEMATICAL MONTHLY. (See Dr. Halsted's Non-Euclidean Geometry, Historical and Expository).

It is a noteworthy honor to America and to the American Mathematical Monthly, thus to have unconsciously anticipated and forestalled the great German scientists.

BOOKS AND PERIODICALS.

A Treatise on Plane and Spherical Trigonometry and Its Application to Astronomy and Geodesy with Numerous Examples. By Edward A. Bowser, LL. D., Professor of Mathematics and Engineering in Rutgers College. 8 vo., cloth and leather back, 368 pp. Price \$1.60. Boston: D. C. Heath & Co.

Excepting Chauvenet's, this is the most complete Treatise on Trigonometry

published in America, and in point of excellence it is superior to that work. In the method of treatment, arrangement, typographical execution, and numerous and well selected exercises it has no superior. The definitions of the functions are given "once for all" and need not be restated and modified when obtuse and reflex angles are considered.

In the development of the theoretical part of the subject, the work is especially interesting and clear.

From the beginning the student is carried along with enthusiasm and with the assurance that he is mastering the subject. The unusually large and well chosen collection of problems are suited to every requirement, and by solving these the student learns to do by doing.

The treatment of Trigonometric Elimination, De Moivre's Theorem, Summation of Series, etc., is more complete than is usually given in text-books.

These observations have been gathered by using the book in the class-room.

B. F. F.

A Treatise on Hydrostatics. By Alfred George Greenhill, Professor of Mathematics in the Artillery College, Woolwich, England. 8vo. cloth, 536 pp. Price, \$1.90. New York: Macmillan & Co.

The aim of the present Treatise on Hydrostatics is to develop the subject from the outset by means of illustrations of existing problems, chosen in general on as large a scale as possible, and carried out to their numerical results; in this way it is hoped that the student will acquire a real working knowledge of the subject, while at the same time the book will prove useful to practical engineers. PREFACE.

The condensed notation proposed by M. Hospitalier at the International Congress of Electricians of 1891 has been adopted. The gravitation unit of force has been universally employed, except a few problems of cosmopolitan interest. Free use is also made of symbols, and operations of the Calculus, the author believing "it is easier to learn the Differential Calculus, than to follow a demonstration which attempts to avoid its use."

Particular attention is given to the applications of the subject in Naval Architecture.

The diagrams used to illustrate objects are accurate and attractive.

The book is written in large type and is the best work on the subject that we have yet examined.

B. F. F.

Analytical Trigonometry. Part II. By S. L. Loney, M. A., Late Fellow of Sidney Sussex College, Cambridge, Professor at the Royal Holloway College, 1894. 8vo, cloth, XXVI+(295 to 480) pp. Price, \$1.00. New York: Macmillan & Co.

In this text is treated nearly every subject in the modern domain of analytical trigonometry.

It begins with a treatment of Exponential & Logarithmic Series. On page 297 is proof of the incommensurability of $e=2.7182818285\dots$

Some of the important subjects discussed in this book are Complex Quantities; De Moivre's Theorem; Circular Functions of Complex Angles; Hyperbolic Functions; Inverse Circular and Hyperbolic Functions; Logarithms of Complex Quantities; Gregory's Series; Principle of Proportional Parts; Errors of Observation; Solution of Cubic Equations; and Maximum and Minimum Values.

The typography and mechanical execution of the book is first class. It is to be hoped that the author will immediately follow it with an equally exhaustive treatise on Spherical Trigonometry.

B. F. F.

Elements of Solid Geometry. By Arthur Latham Baker, Ph. D., Prof. of Mathematics in the University of Rochester. 136 pp. 1893. Boston: Ginn & Company.

This compact little volume makes a favorable impression. We note as special features an improved notation, special regard to the perspective of the figures in the diagrams, and the clear presentation of the different parts of the discussions under distinct headings. We are particularly pleased with the importance given to generalized conceptions, the general theorems for the frustum of a pyramid, being first worked out, and then the pyramid, cone, prism, and cylinder being discussed as special cases. Great condensation of matter, as well as a broader conception of the subject on the part of the student, is thus secured. The author does not hesitate to speak emphatically of what he regards as good features in his book. Witness the following: "The whilom popular idea that each proposition must occupy an entire page or pages is discarded. A *short* demonstration is made *short*. The student is not deceived into thinking he has learned a page of geometrical truth, when in fact he has learned but a few lines."

The book closes with a short geometrical treatment of the conic sections.

J. M. C.

The Science Absolute of Space. Independent of the Truth or Falsity of Euclid's Axiom XI (which never can be established *a priori*). By John Bolyai. Translated into English by George Bruce Halsted, A. M., Ph. D., ex-Fellow of Princeton College and Johns Hopkins University, Professor of Mathematics in the University of Texas. First edition, 1891. Second edition, 1893. Price, bound and postpaid, \$1.25.

This translation is prefaced by a valuable Introduction by the translator, in which are revealed some very fine historic facts pertaining to the respective discussions of Bolyai, Gauss, and Riemann.

Appendix I. Remarks on the preceding Memoir, by Wolfgang Bolyai; Appendix II. Some points in John Bolyai's Appendix compared with Lobtschewsky, by Wolfgang Bolyai. Appendix III. Light from non-Euclidean Spaces on the Teaching of Elementary Geometry, by G. B. Halsted.

This excellent translation should be in the hands of every teacher of geometry.

B. F. F.

About Square Numbers Whose Sum is a Square Number. By Artemas Martin, LL. D., Washington, D. C. 1893.

The above is a pamphlet *reprint* of three articles which appeared in late numbers of the *Mathematical Magazine*, and fills 24 pages of the size of that periodical. A study like this by Dr. Martin, upon a subject with which he is so well acquainted, assures a most interesting and instructive treatment. Those of our subscribers who are fond of the Diophantine Analysis will find a special interest in these pages by the distinguished editor of the *Magazine* and the *Visitor*.

J. M. C.

Standard Arithmetic. By William J. Milne, Ph. D., LL. D., President of the New York State Normal College, Albany, N. Y. 430 pp. Price, 65 cts. New York: American Book Company,

The book before us embraces a complete course for Schools and Academies, and is certainly one of the best Arithmetics now before the public. In view of the recent discussion in the MONTHLY, it is interesting to note section 83, p. 68, (1), "The dividend and divisor must be like numbers;" (2), "The quotient must be an abstract number." However, the author fails to show how $\frac{1}{2}$ of \$12 can be found, and in denominated numbers calls bu. pk.. etc., a *quotient!*"

The order and arrangement of subjects is the best we have seen, except the placing of common *before* decimal fractions. We regard the position of tables in the back of the book as a nuisance.

There are a great many problems, but in some parts we note lack of variety, and a tendency to state many of them in the direct form, so that after the first is solved the solution of the others becomes only a mechanical process. In a few places, -e.g, in reducing mixed numbers to improper fractions-, the rule given is not derived from the process. In general the explanations are lucid, the steps logical, and the definitions brief and accurate. The treatment of "business arithmetic" is unsurpassed, and as a whole the book so well meets the needs of both teacher and pupil, that we regard it as one of the best approaches to an ideal Arithmetic. "*Elements of Arithmetic*" is the introductory book of the series. J. M. C.

The Educational Times (London) for May is at hand. The list of problems propose for solution contains five problems reproduced from No. 1 of the MONTHLY.

The last numbers of *Annals of Mathematics* has the following articles; "On the Jacobian Elliptic Functions," by Prof. Irving Stringham; and "Transformation Groups," by J. M. Page. Thre exercises are solved and three proposed.

Miscellaneous Notes and Queries. We have received the April and May numbers of this valuable Monthly. We note in the former number an interesting article on "Method of Finding the Date of Easter," by our contributor, Prof. H. A. Wood, A. M., of the Stevens School, Hoboken, N. J., and "Some Practical Geometry," by our subscriber, Thos. P. Stowell, of Rochester, N. Y.

ERRATA.

Page 75, 11th line from bottom, for primitive read primitive.

Page 122, last line, for $=\bar{x}$ read $\bar{x}=$.

Page 125, middle of page, for "to $\frac{m+1}{2}$ factors...." read $\frac{m-1}{2}$ factors....

Page 129, in solution to 10, for, From (1) subtract (2), (3), (4), read Subtract (1) from (2), (3), (4).

Page 138, middle of page, for "asperations" read *aspirations*.